Solvothermal syntheses of NiFe alloys for electrochemical reduction of CO_2

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Herein, an approach to the controlled synthesis of a star shaped flower like magnetic NiFe bimetallic electrocatalyst was performed using a simple solvothermal reaction in water and ethanol solution at 100 °C. The strong intensity of the XRD pattern suggests the high crystallinity of the product obtained even at low temperature of 100 °C. The obtained NiFe alloy was characterized by FESEM and XPS to determine the morphology and oxidation states of elements, respectively. The superior performance of the catalyst for the electrochemical reduction of CO_2 to acetic acid is mainly due to the 3-dimensional secondary growth which provides higher electrochemical surface area and fast movement of ions. This work was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (NRF 2016R1D1A1B03930855).

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